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|-----------------|---|--|
| Post Graduate | Professor: One Associate Professor: One Assistant Professor: One Lab Technician: One Lab Attendant: Two | Professor: One Associate Professor: Two Assistant Professor: Two |
| Ph.D | Professor: Two Associate Professor: Two Assistant Professor: One | Professor: Two Associate Professor: Two Assistant Professor: Two |
| Diploma | Assistant Professor: One Lab Technician: One Lab Attendant: One | |
| Other (specify) | | |

4. Equipments: (To be submitted for each Departments)

| Level of programme | For 03 seats in each department | For 05 seats in each department | Remarks |
|--------------------|--|---------------------------------|---------|
| Post Graduate | <ul style="list-style-type: none"> • Post mortem kits • Hot air oven • Tissue embedding system • Water Bath • Microtome • Cryostat microtome • Centrifuge • Hematology analyzer • Serum Chemistry analyzer • Binocular microscopes 10 • Advanced Microscopy system with fluorescent attachment and digital imaging facilities • Refrigerated Centrifuge • PCR facility • Refrigerator • Deepfreeze • Incinerator | | |
| Ph.D | | | |
| Diploma | | | |
| Other (specify) | | | |

Syllabus

PG (Veterinary Pathology)

- Interpretation of histopathology and biopsy slides may be added to the PG curriculum 0+1

PhD (Veterinary Pathology)

- No changes required

Proposed Course Structure
VETERINARY PATHOLOGY

| COURSE NO. | COURSE TITLE | CREDITS | SEM |
|-------------------|--|----------------|------------|
| VPP 601 | General Pathology | 2+1 | I |
| VPP 602 | Techniques in Pathology | 1+1 | I |
| VPP 603 | Animal Oncology | 1+1 | I |
| VPP 604 | Clinical Pathology | 1+2 | I |
| VPP 605 | Necropsy Procedures and Interpretations | 1+1 | I, II |
| VPP 606 | Systemic Pathology | 2+1 | II |
| VPP 607 | Pathology of Infectious Diseases of Domestic Animals | 2+1 | II |
| VPP 608 | Toxicopathology | 2+1 | II |
| VPP 609 | Avian Pathology | 2+1 | I |
| VPP 610 | Pathology of Wild/ Zoo and Aquatic Animal Diseases | 1+1 | II |
| VPP 611 | Pathology of Laboratory Animal Diseases | 1+1 | II |
| VPP 691 | Master's Seminar | 1 | I, II |
| VPP 699 | Master's Research | 30 | I, II |
| VPP 701 | Molecular and Ultrastructural Basis of Cell Injury | 1+1 | I |
| VPP 702 | Advances in Toxicopathology | 2+1 | I |
| VPP 703 | Advances in Diagnostic Pathology | 1+2 | I |
| VPP 704 | Immunopathology | 2+1 | II |
| VPP 705 | Pathology of Important and Emerging Infectious & Non-Infectious Diseases of Pets and Livestock | 1+1 | II |
| VPP 706 | Advances in Avian Pathology | 2+1 | I |
| VPP 707 | Pathology of Fungal Diseases | 2+1 | II |
| VPP 708 | Experimental Pathology | 1+1 | I |
| VPP 790 | Special Problem | 0+2 | I, II |
| VPP 791 | Doctoral Seminar-I | 1 | I, II |
| VPP 792 | Doctoral Seminar-II | 1 | I, II |
| VPP 799 | Doctoral Research | 70 | I, II |

VETERINARY PATHOLOGY

Course Contents

VPP 601 GENERAL PATHOLOGY 2+1 SEM - I

Objective

To acquaint students with different types of degenerations, cell injuries caused by different types of irritants and inflammation.

Theory

UNIT-I: Introduction and history of pathology, principles of pathology including etiology, course and termination of disease.

UNIT-II: Advanced study of various degenerations, infiltrations, necrosis, apoptosis, and gangrene, endogenous and exogenous pigmentations.

UNIT-III: Circulatory and growth disturbances. Reversible and irreversible cell injury.

UNIT-IV: Inflammation and its different types including vascular and cellular alterations with emphasis on chemical mediators. Hypersensitivity and immune mediated mechanisms, Mechanism of healing and fever.

Practical

- To study the morphologic descriptions of lesions and nomenclature of a morphologic diagnosis based on gross and/ or microscopic lesions of variety of conditions (degenerations, infiltrations, pigmentations, necrosis, circulatory and growth disturbances and different types of inflammation) in the preserved specimens/ slides. Demonstration of post-mortem changes.
- Continuous assessment of students for their skills in the diagnosis of gross lesions during post-mortem examination of different tissues of domestic animals.
- Preparation of histopathology slides on the selected cases followed by interaction in the student seminars/ group discussions.

Suggested Readings

- McGavin MD & Zachary JF. 2006. *Pathologic Basis of Veterinary Diseases*. 4th Ed. Elsevier
- Vegad JL. 2007. *Text Book of Veterinary General Pathology*. 2nd Ed. International Book Distr.

VPP 602 TECHNIQUES IN PATHOLOGY 1+1 SEM - I

Objective

To acquaint students with different techniques used frequently in Veterinary Pathology.

Theory

UNIT-I: Basic histopathological techniques, collection of tissues, fixation, processing and section cutting, staining by routine and special methods.

UNIT-II: Principles of dark ground, phase contrast and fluorescent microscopy and micrometry.

UNIT-III: Histochemical techniques for demonstration of fat, glycogen and fibrous connective tissue, mucopolysaccharides and common enzymes.

Practical

- Collection of tissues for histopathological, histochemical, toxic, bacterial and

viral examination.

- Application of different techniques- histopathological, cryosectioning, micrometry, routine and special staining.
- Demonstration of different inclusions, bacteria and fungi in tissues.
- Histochemical techniques to demonstrate different tissue constituents.
- Museum specimen preparation and maintenance.
- Demonstration of Immunohistochemical procedure in tissue sections.

Suggested Readings

- Culling CFA. 1969. *Handbook of Histological Techniques*. Butterworths.
- Lillie RD. 1965. *Histopathologic Techniques and Practical Histo-chemistry*. 3rd Ed. McGraw-Hill.
- Culling CFA. 2013. *Handbook of Histopathological and Histochemical Techniques: Including Museum Techniques* PDF, eBook (<http://mbooknom.men/go/best.php?id=B01DRY52U8>)

VPP 603 ANIMAL ONCOLOGY 1+1 SEM - I

Objective

To acquaint students with different types of neoplasms of domestic animals, their nature, cause, pathology and diagnosis.

Theory

UNIT-I: Study of different neoplasms of animals including their identification, and epidemiology.

UNIT-II: Tumor characteristics, Etiology, Molecular oncogenesis, Tumour spread and experimental reproduction.

UNIT-III: Tumour immunology, Tumour diagnosis.

Practical

To study the gross and microscopic changes in different types of neoplasms, Cytological diagnosis of tumours via impression smears and Fine Needle Aspiration Cytology and immunohistochemistry.

Suggested Readings

- Meuten DJ. 2002. *Tumors in Domestic Animals*. 4th Ed. Blackwell.
- Meuten DJ. 2017. *Tumors in Domestic Animals*. Blackwell.

VPP 604 CLINICAL PATHOLOGY 1+2 SEM - I

Objective

To acquaint students with clinical alterations in blood, urine, CSF and other body fluids due to different diseases.

Theory

UNIT-I: Study of changes in blood, urine, faeces, cerebrospinal fluid and biopsy

specimens and their interpretation.

UNIT-II: Exfoliative cytology, organ function tests and their interpretation.

UNIT-III: Biochemical profile of blood/plasma/serum and its correlation with disease conditions in domestic animals.

Practical

Analysis of clinical samples [blood/ serum/ plasma, urine, faeces, Biopsy samples (exfoliative/ FNAC), ruminal content, cerebrospinal fluid etc.] including biochemical profile for organ function tests in different disease conditions in animals/ poultry and their interpretations.

Suggested Readings

- Benzamin MM. 1978. *Outline of Veterinary Clinical Pathology*. 3rd Ed. Iowa State Univ. Press.
- Coles EH. 1967. *Veterinary Clinical Pathology*. WB Saunders.
- Amy C. Valenciano, Rick L. Cowell. 2013. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat*, 4th Ed, Elsevier
- Douglas J., Weiss, K and Jane Wardrop. 2010. *Schalm's Veterinary Haematology*, Wiley.

VPP 605 NECROPSY PROCEDURES AND II

1+1 SEM - I,

INTERPRETATIONS

Objective

To acquaint students with different Post-mortem procedures in large animals and study of PM lesions in different diseases & to educate the students about common veterolegal problems and legal writing of PM report.

Theory

UNIT-I: General knowledge about the laws relating to veterinary practice, professional discipline and professional etiquettes.

UNIT-II: Regulations dealing with diseases of animals in India regarding epidemiology, quarantine certificate, issue of soundness certificate etc.

UNIT-III: Common causes of violent death, criminal assault, cruelty to animals, malicious poisoning, snake bite, electrocution, gunshot wounds, automobile accidents, doping etc.

Practical

- Detailed necropsy examination of various species of farm animals, laboratory animals and wildlife.
- Necropsy case presentation and report writing/protocol preparation.
- Collection of specimens for diagnosis of viral, bacterial, protozoan, parasitic diseases, toxic/ poisoning and for histochemistry/histopathology.
- Systemic examination of brain, lungs, heart, endocrine glands, lymph nodes, liver, gastro Intestinal tract, urinary and genital systems for gross pathological and histopathological studies and correlation of the observations to diagnose the disease conditions.

Suggested Readings

- Jones TC & Gleiser CA. 1954. *Veterinary Necropsy Procedures*. JB Lippincott
- Gahlot AK, Sharma SN & Tanwar RA. 2003. *Veterinary Jurisprudence*. 5th Ed. NBS Publishers, Bikaner.
- Lincoln PJ & Thomson J. 1998. *Forensic DNA Profiling Protocols*. Humana Press.
- Rudin N & Inman K. 2002. *An Introduction to Forensic DNA Analysis*. CRC Press.

VPP 606 SYSTEMIC PATHOLOGY 2+1 SEM - II

Objective

To teach the students about the different disease conditions of haemopoietic, circulatory, respiratory, digestive, urinary and genital systems, nervous, musculoskeletal, endocrine, glands and special senses.

Theory

UNIT-I: Advanced study of pathological conditions affecting different organs of haemopoietic (bone marrow, blood, spleen, lymph node), circulatory (heart, blood vessels and lymph vessels). Respiratory (nasal cavity, larynx, trachea, bronchi, lung and pleura) systems. Study of etiology, pathology and pathogenesis of specific infectious and non-infectious diseases of domestic animals related to the above mentioned systems.

UNIT-II: Advanced study of pathological conditions affecting different organs of digestive (buccal cavity, pharynx, oesophagus, stomach and intestines) urinary (kidneys, ureter, urinary bladder and urethra) and genital (male and female organs including mammary gland) systems. Study of etiology, pathology and pathogenesis of specific infectious and non-infectious diseases of domestic animals related to the above mentioned systems.

UNIT-III: Advanced study of pathological conditions affecting different organs of nervous (brain and spinal cord), endocrine (pituitary, thyroid, parathyroid, pancreas), musculo-skeletal systems (muscles and bones), and organs of special senses (eye, ear), skin and its appendages (hoof, tail). Study of etiology, pathology and pathogenesis of specific infectious and non- infectious diseases of domestic animals related to the above mentioned systems/organs

Practical

- To study the gross and histopathological changes in important conditions affecting various systems. Study of gross and microscopic lesions in specific diseases pertaining to above said systems.
- Continuous assessment of students for their skills in the morphologic description of lesions and nomenclature of a morphologic diagnosis based on gross and/ or microscopic lesions in variety of organs during post-mortem examination of domestic animals followed by interaction in the student seminars/ group discussions.

Suggested Readings

- Jubb KVF & Kennedy PC. 2005. *Pathology of Domestic Animals*. Academic

Press.

- Grant Maxie. 2015. Jubb, Kennedy & Palmer's Pathology of Domestic Animals, 6th Ed.
Saunders Ltd.

VPP 607 PATHOLOGY OF INFECTIOUS DISEASES 2+1 SEM - II OF DOMESTIC ANIMALS

Objective

To teach the students about the important infectious disease conditions of domestic animals.

Theory

UNIT-I: Pathology of various viral diseases of domestic animals.

UNIT-II: Pathology of various bacterial and fungal diseases of domestic animals.

UNIT-III: Pathology of various rickettsial and parasitic diseases of domestic animals.

Practical

To study the slides, museum specimens including autopsy specimens concerned with specific diseases.

Suggested Readings

Jones TC, Hunt RD & King NW 1997. *Veterinary Pathology*. Blackwell Publishing.

Jubb KVF & Kennedy PC 2005. *Pathology of Domestic Animals*. Academic Press.

VPP 608 TOXICOPATHOLOGY 2+1 SEM - II

Objective

To teach students about toxicity in livestock due to plants and extraneous poisons.

Theory

UNIT-I: Introduction, mode of action, diagnosis and treatment of different poisons and their classification.

UNIT-II: Pathogenesis, gross and microscopic pathology of diseases caused by toxic plants, organic and inorganic poisons commonly taken or administered maliciously to different species of domestic animals.

Practical

To study gross and histopathological alterations as a result of ingestion of toxic plants and extraneous poisons in domestic animals.

Suggested Readings

Jones TC, Hunt RD & King NW 1997. *Veterinary Pathology*. Blackwell Publishing.

VPP 609 AVIAN PATHOLOGY 2+1 SEM - I

Objective

To teach the students about the different disease conditions of poultry including pathology and diagnosis.

Theory

UNIT-I: Pathology of infectious diseases of chickens, turkeys, ducks and other birds.

UNIT-II: Pathology of non-infectious diseases of chickens, turkeys, ducks and other

occurring diseases of Rats

Unit III: Etiology, transmission, gross and microscopic pathology of commonly occurring diseases of Mice.

Unit IV: Etiology, transmission, gross and microscopic pathology of commonly occurring diseases of Guinea pigs

Unit V: Etiology, transmission, gross and microscopic pathology of commonly occurring diseases of Hamsters, Gerbills and primates.

Practical

- Post-mortem examination of laboratory animals.
- Study of gross and microscopic lesions of important infectious and non-infectious diseases of laboratory animals

Suggested Readings

- Beninchka K, Garner FM & Jones TC. 1978. *Pathology of Laboratory Animals*. Vols. I, II. Springer Verlag.
- Stephen W. Barthold, Stephen M. Griffey, Dean H. Percy. 2016. *Pathology of Laboratory Rodents and Rabbits*. Wiley Blackwell.

VPP 701 MOLECULAR AND ULTRASTRUCTURAL 1+1 SEM - I BASIS OF CELL INJURY

Objective

To study the significance of ultra-structural changes in organelles.

Theory

UNIT-I: Study of cells- cell morphology, interpretation of normal and abnormal cells.

UNIT-II: Study of cell organelles, degenerations, infiltrations, viral inclusions.

UNIT-III: Causes of cell injury - Ischemic, Hypoxic, Free radicals, virus and chemical cell injury - Chemical Mediators - Cytoskeletal and biochemical changes in cell injury.

UNIT-IV: Ultrastructural changes and biochemical mechanisms of reversible injury, necrosis, apoptosis. Molecular basis of disease. Cellular adaptation- hyperplasia, hypertrophy, atrophy, metaplasia and dysplasia. Intracellular accumulations.

UNIT-V: Inflammation- mechanism and types. Tissue repair and healing.

Practical

- Gross and histopathological studies pertaining to above conditions.
- Study of EM photographs, collection and preparation of specimens for EM studies.

Suggested Readings

Selected articles from journals.

VPP 702 ADVANCES IN TOXICOPATHOLOGY 2+1 SEM - I

Objective

To teach students about toxicity in livestock due to plants and extraneous poisons.

Theory

UNIT-I: Introduction, mode of action, diagnosis and treatment of different poisons and their classification. Experimental animal models for toxicity studies and evaluation of parameters.

UNIT-II: Pathogenesis, gross and microscopic pathology of diseases caused by toxic plants, organic and inorganic poisons commonly taken or administered maliciously to different species of domestic animals.

Practical

Clinico-pathological studies on natural or experimentally induced toxicity /poisoning in domestic animals. To study gross and histopathological alterations as a result of ingestion of toxic plants and extraneous poisons in domestic animals.

Suggested Readings

Selected articles from journals.

VPP 703 ADVANCES IN DIAGNOSTIC PATHOLOGY 1+2 SEM - I

Objective

To teach current diagnostic techniques for diagnosis of different diseases.

Theory

UNIT-I: Study of the principles of biopsy techniques and electron microscopy.

UNIT-II: Current techniques for diagnosis of diseases.

Practical

Principles and practice of fluorescent and phase contrast microscopy, fluorescent in situ hybridization (FISH), In situ PCR, spectrophotometry and immunodiffusion technique, use of laboratory animals, chick embryos etc. for the diagnosis of animal diseases.

Suggested Readings

Selected articles from journals.

VPP 704 IMMUNOPATHOLOGY 2+1 SEM - II

Objective

To teach students immunologically mediated and autoimmune diseases of livestock.

Theory

UNIT-I: Principles of immunopathology, hypersensitivity status, pathology of immune complex diseases.

UNIT-II: Immunoproliferative disorders, autoimmune diseases and immune deficiencies in man and domestic animals.

Practical

Immune complexes, quantification and determination by various techniques, enumeration of various populations of lymphocytes by different techniques, determination of C3 levels, autoimmune reaction by demonstrating autoantibodies, hypersensitivity reactions(class IV and others).

Suggested Readings

Selected articles from journals.

VPP 705 PATHOLOGY OF IMPORTANT AND EMERGING 1+1 SEM - II INFECTIOUS & NON-INFECTIOUS DISEASES OF PETS AND LIVESTOCK

Objective

To teach students important and emerging diseases including nutritional and metabolic disorders of pets and livestock.

Theory

UNIT-I: Introduction to emerging diseases, foot and mouth disease, vesicular stomatitis, vesicular exanthema, rinderpest/Peste des petits ruminants, parainfluenza -3, infectious bovine rhinotracheitis/infectious pustular vulvovaginitis, bovine spongiform encephalopathy, scrapie, blue tongue, malignant catarrhal fever, mucosal disease/bovine viral diarrhoea, bovine leucosis.

UNIT-II: Tuberculosis/Johne's disease, brucellosis, listeriosis, caprine arthritis, campylobacteriosis, encephalitis, parvovirus infection, emerging diseases of pets.

UNIT-III: Pathogenesis, gross and microscopic pathology of nutritional deficiencies viz. carbohydrate, protein, fats, vitamins and macro and microelements and their imbalances.

UNIT-IV: Different metabolic diseases namely milk fever, ketosis, tetany, azoturia. Downer's cow syndrome and post parturient hemoglobinuria in domestic animals.

Practical

- Study of clinical and gross alterations and histopathology of some important emerging and enzootic diseases.
- Estimation of certain minerals in sera of natural and experimentally induced deficiencies in domestic animals.
- To study the haematological, gross and microscopic pathological alterations caused by nutritional and metabolic disorders.

Suggested Readings

Selected articles from journals.

VPP 706 ADVANCES IN AVIAN PATHOLOGY 2+1 SEM - I

Objective

To teach different diagnostic techniques for diagnosis of different avian diseases.

Theory

UNIT-I: Advances in pathogenesis and pathology including molecular basis of important infections (bacterial, viral, fungal and parasitic).

UNIT-II: Non-infectious diseases with particular emphasis on emerging diseases of chickens, turkeys, ducks and other birds.

Practical

- Necropsy examination of different species of poultry. Study of gross and microscopic lesions in natural and experimentally produced diseases in different species of birds.
- Diagnosis of different diseases of poultry.

Suggested Readings

Selected articles from journals.

VPP 707 PATHOLOGY OF FUNGAL DISEASES 2+1 SEM - II

Objective

To teach the diseases caused by different fungi and mycotoxins in animals.

Theory

UNIT-I: Pathology of diseases associated with pathogenic fungi like aspergillosis, candidiasis, epizootic lymphangitis, histoplasmosis, coccidioidomycosis, cryptococcosis, bovine abortions, dermatophytomycosis etc.

UNIT-II: Diseases associated with mycotoxins like aflatoxins, rubratoxin, T2 toxin, ochratoxin etc. Metabolism of toxins and their effect in man, domestic and laboratory animals, poultry and aquatic species.

Practical

Demonstration of pathogenic mycotoxic fungi, chemistry of toxic compounds, physical and chemical properties, methods of extraction, isolation and identification of mycotoxins.

Suggested Readings

Selected articles from journals.

VPP 708 EXPERIMENTAL PATHOLOGY 1+1 SEM - I

Objective

To provide expertise in designing the experiments and handling of animals.

Theory

UNIT-I: Need for experimentation in research, animal experimentation techniques, preparation of experimental protocols, biochemical studies, pathological examination of clinical samples.

UNIT-II: Transplantation techniques, immune regulation, tissue culture, blood cell separation protocols, electrophoresis and chromatography, study of animal model and designing of experiment.

Practical

Short research problems involving contemporary issues and research techniques.

Suggested Readings

Selected articles from journals.

**VPP 790 SPECIAL PROBLEM 0+2 SEM - I,
II**

Objective

To provide expertise in handling practical research problem(s).

Practical

Short research problem(s) involving contemporary issues and research techniques.

VETERINARY PATHOLOGY

List of Journals

- Advances in Veterinary Sciences
- American Journal of Veterinary Medical Association
- Avian Diseases
- Avian Pathology
- Current Contents
- Indian Journal of Animal Sciences
- Indian Journal of Poultry Science
- Indian Journal of Veterinary Pathology
- Journal of Immunology and Immunopathology
- Veterinary Bulletin
- Veterinary Pathology

e-Resources

- www.iavp.org (Indian Journal of Veterinary Pathology)
- www.vetpathology.org (Veterinary Pathology)
- www.tandf.co.uk (Avian Pathology)
- www.avdi.allenpress.com (Avian Diseases)
- www.elsevier.com/locate/vetimm (Veterinary Immunology and Immunopathology)

Suggested Broad Topics for Master's and Doctoral Research

- Effect of probiotics on pathogenesis and pathology of bacterial diseases
- Effect of antioxidants on pathogenesis and pathology of bacterial diseases
- Pathology of mixed infections in domestic animals
- Role of stress in pathogenesis and pathology of animal diseases

Non-credit compulsory courses for M.V.Sc.

| Course No. | Course title | Credit hours | Semester |
|--------------------|---|---------------------|-----------------|
| PGS 501 | Library and information services | 0+1 | I and II |
| PGS 502 | Technical writing and communication skills | 0+1 | I and II |
| PGS 503 (e-course) | Intellectual property and its management in Veterinary and animal husbandry | 1+0 | I and II |
| PGS 504 | Basic concepts in laboratory techniques | 0+1 | I and II |
| PGS 505 (e-course) | Disaster management | 1+0 | I and II |

Syllabus of Common Courses for PG programmes

PGS 501 LIBRARY AND INFORMATION SERVICES (0+1)

Objective

To equip the library users with skills to trace information from libraries efficiently, to apprise them of information and knowledge resources, to carry out literature survey, to formulate information search strategies, and to use modern tools (Internet, OPAC, search engines, etc.) of information search.

Practical

Introduction to library and its services; Role of libraries in education, research and technology transfer; Classification systems and organization of library; Sources of information- Primary Sources, Secondary Sources and Tertiary Sources; Intricacies of abstracting and indexing services (Science Citation Index, Biological Abstracts, Chemical Abstracts, CABI Abstracts, etc.); Tracing information from reference sources; Literature survey; Citation techniques/ Preparation of bibliography; Use of CD-ROM Databases, Online Public Access Catalogue and other computerized library services; Use of Internet including search engines and its resources; e- resources access methods.

PGS 502 TECHNICAL WRITING AND COMMUNICATIONS SKILLS (0+1)

Objective

To equip the students/ scholars with skills to write dissertations, research papers, etc. To equip the students/ scholars with skills to communicate and articulate in English (verbal as well as writing).

Practical (Technical Writing)

- Various forms of scientific writings- theses, technical papers, reviews, manuals, etc.;
- Various parts of thesis and research communications (title page, authorship contents page, preface, introduction, review of literature,

material and methods, experimental results and discussion);

- Writing of abstracts, summaries, précis, citations, etc.;
- Commonly used abbreviations in the theses and research communications;
- Illustrations, photographs and drawings with suitable captions; pagination, numbering of tables and illustrations;
- Writing of numbers and dates in scientific write-ups;
- Editing and proof-reading;
- Writing of a review article;
- Communication Skills - Grammar (Tenses, parts of speech, clauses, punctuation marks);
- Error analysis (Common errors), Concord, Collocation, Phonetic symbols and transcription;
- Accentual pattern: Weak forms in connected speech;
- Participation in group discussion;
- Facing an interview;
- Presentation of scientific papers.

Suggested Readings

1. Barnes and Noble. Robert C. (Ed.). 2005. Spoken English: Flourish Your Language.
2. Chicago Manual of Style. 14th Ed. 1996. Prentice Hall of India.
3. Collins' Cobuild English Dictionary. 1995.
4. Harper Collins. Gordon HM and Walter JA. 1970. Technical Writing. 3rd Ed.
5. Holt, Rinehart and Winston. Hornby AS. 2000. Comp. Oxford Advanced Learner's Dictionary of Current English. 6th Ed. Oxford University Press.
6. James HS. 1994. Handbook for Technical Writing. NTC Business Books.
7. Joseph G. 2000. MLA Handbook for Writers of Research Papers. 5th Ed. Affiliated East-West Press.
8. Mohan K. 2005. Speaking English Effectively. MacMillan India.
9. Richard WS. 1969. Technical Writing.
10. Sethi J and Dhamija PV. 2004. Course in Phonetics and Spoken English. 2nd Ed. Prentice Hall of India.
11. Wren PC and Martin H. 2006. High School English Grammar and Composition.

S. Chand & Co.

PGS 503 (e-course) INTELLECTUAL PROPERTY AND ITS

MANAGEMENT IN VETERINARY AND ANIMAL HUSBANDRY (1+0)

Objective

The main objective of this course is to equip students and stakeholders with knowledge of Intellectual Property Rights (IPR) related protection systems, their significance and use of IPR as a tool for wealth and value creation in a knowledge- animal health and production based economy.

Theory

Historical perspectives and need for the introduction of Intellectual Property Right regime; TRIPs and various provisions in TRIPs Agreement; Intellectual Property and Intellectual Property Rights (IPR), benefits of securing IPRs; Indian Legislations for the protection of various types of Intellectual Properties; Fundamentals of patents, copyrights, geographical indications, designs and layout, trade secrets and traditional knowledge, trademarks, protection of animal breeds/strains and farmers' rights and biodiversity protection; Protectable subject matters, protection in biotechnology, protection of other biological materials, ownership and period of protection; National Biodiversity protection initiatives; Convention on Biological Diversity; International Treaty on Plant Genetic Resources for Food and Agriculture; Licensing of technologies, Material transfer agreements, Research collaboration Agreement, License Agreement.

Suggested Readings

1. Erbisch FH and Maredia K.1998. Intellectual Property Rights in Agricultural Biotechnology. CABI.
2. Ganguli P. 2001. Intellectual Property Rights: Unleashing Knowledge Economy. McGraw-Hill.
3. Intellectual Property Rights: Key to New Wealth Generation. 2001. NRDC and Aesthetic Technologies.
4. Ministry of Agriculture, Government of India. 2004. State of Indian Farmer. Vol. V. Technology Generation and IPR Issues. Academic Foundation.
5. Rothschild M and Scott N. (Ed.). 2003. Intellectual Property Rights in Animal Breeding and Genetics. CABI.
6. Saha R. (Ed.). 2006. Intellectual Property Rights in NAM and Other Developing Countries: A Compendium on Law and Policies. Daya Publ. House.

The Indian Acts - Patents Act, 1970 and amendments; Design Act, 2000; Trademarks Act, 1999; The Copyright Act, 1957 and amendments; Layout Design Act, 2000; PPV and FR Act 2001, and Rules 2003; The Biological Diversity Act, 2002.

PGS 504 BASIC CONCEPTS IN LABORATORY TECHNIQUES (0+1)

Objective

To acquaint the students about the basics of commonly used techniques in laboratory.

Practical

- Safety measures while in Lab;

- Handling of chemical substances;
- Use of burettes, pipettes, measuring cylinders, flasks, separatory funnel, condensers, micropipettes and vaccumets;
- Washing, drying and sterilization of glassware;
- Drying of solvents/ chemicals;
- Weighing and preparation of solutions of different strengths and their dilution;
- Handling techniques of solutions;
- Neutralisation of acid and bases;
- Preparation of buffers of different strengths and pH values;
- Use and handling of microscope, laminar flow, vacuum pumps, viscometer, thermometer, magnetic stirrer, micro-ovens, incubators, sandbath, waterbath, oil-bath;
- Electric wiring and earthing;
- Preparation of media and methods of sterilization;
- Cell/Tissue cultures
- Description of animal species and breeds

Suggested Readings

1. Furr AK. 2000. CRC Hand Book of Laboratory Safety. CRC Press.
2. Gabb MH and Latchem WE. 1968. A Handbook of Laboratory Solutions. Chemical Publ. Co.

PGS-505 (e-course)

Disaster management 1+0

Objectives:

To introduce learners to the key concepts and practices of natural disaster management; to equip them to conduct thorough assessment of hazards, and risks vulnerability; and capacity building.

Theory

UNIT I: Natural Disasters- Meaning and nature of natural disasters, their types and effects. Floods, Drought, Cyclone, Earthquakes, Landslides, Avalanches, Volcanic eruptions, Heat and cold Waves, Climatic Change: Global warming, Sea Level rise, Ozone Depletion.

UNIT II: Man Made Disasters- Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire. Oil fire, air pollution, water pollution, deforestation, Industrial wastewater pollution, road accidents, rail accidents, air accidents, sea accidents.

UNIT III: Disaster Management- Efforts to mitigate natural disasters at national and global levels. International Strategy for Disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, Community-based organizations, and media. Central, State, District and local Administration; Armed forces in Disaster response; Disaster response: Police and other organizations.

Suggested Readings

Gupta HK. 2003. Disaster Management. Indian National Science Academy. Orient

Blackswan.

Hodgkinson PE & Stewart M. 1991. Coping with Catastrophe: A Handbook of Disaster Management. Routledge.

Sharma VK. 2001. Disaster Management. National Centre for Disaster Management, India.

Compulsory course for Ph.D. students from all disciplines

RPE 700 RESEARCH AND PUBLICATION ETHICS (1+1) Semester I and II

I. Theory

RPE 01: Philosophy and Ethics

- Introduction to philosophy: definition, nature and scope, concept, branches
- Ethics: definition, moral philosophy, nature of moral judgements and reactions

RPE 02: Scientific Conduct

- Ethics with respect to science and research
- Intellectual honesty and research integrity
- Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
- Redundant publications: duplicate and overlapping publications, salami slicing
- Selective reporting and misrepresentation of data
- Publication ethics: definition, introduction and importance
- Best practices/ standards setting initiatives and guidelines: COPE, WAME, etc.
- Conflicts of interest
- Publication misconduct: definition, concept, problems that lead to unethical behavior and vice versa, types
- Violation of publication ethics, authorship and contributorship
- Identification of publication misconduct, complaints and appeals
- Predatory publishers and journals

II. Practical

RPE 4: Open Access Publishing

- Open access publications and initiatives
- SHERPA/ RoMEO online resource to check publisher copyright and self-archiving policies

- Software tool to identify predatory publications developed by SPPU
- Journal finder/ journal suggestion tools, viz., JANE, Elsevier Journal Finder, Springer Journal Suggested, etc.

RPE 05: Publication Misconduct

A. Group Discussions

- Subject specific ethical issues, FFP, authorship
- Conflicts of interest
- Complaints and appeals: examples and fraud from India and abroad

B. Software tools

- Use of plagiarism software like Turnitin, Urkund and other open source software tools

RPE 06: Databases and Research Metrics

A. Databases

- Indexing databases
- Citation databases: Web of Science, Scopus, etc.

B. Research Metrics

- Impact Factor of journal as per Journal Citation Report, SNIP, SIR, IPP, CiteScore
- Metrics: h-index, g index, i10 index, altmetrics